IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of	)	
Tony AMATO et al.	)	Confirmation No. 2453
Application No. 10/534,124	)	Art Unit: 2834
Filed: November 18, 2005	)	Examiner: Bryan P. Gordon
For: ULTRASONIC APPARATUS AND THE MANUFACTURE THEREOF	))	Date: November 23, 2009

APPEAL BRIEF

Mail Stop Appeal Brief – Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the provisions of 35 U.S.C. § 134 and 37 C.F.R. § 41.37, Appellants submit this Appeal Brief in support of the Notice of September 29, 2009, to appeal the Examiner's final rejections set forth in the Final Office Action dated April 29, 2009.

I. REAL PARTY IN INTEREST

Sonico Limited is the assignee and real party in interest.

II. RELATED APPEALS AND INTERFERENCES

There are presently no appeals or interferences known to Appellants, Appellants' representative, or the assignee, which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

For the purposes of this Appeal, claims 1-9 are pending, and claims 10-20 are canceled. This Appeal is taken from the rejection of claims 1-9, as submitted in the Appendix herewith.

IV. STATUS OF AMENDMENTS

No claim amendments have been made subsequent to the Final Office Action of April 29, 2009.

V. SUMMARY OF CLAIMED SUBJECT MATTER

This Appeal is taken from the rejection of claims 1-9, of which claim 1 is independent.

Independent claim 1 relates to a sewage slurry ultrasonic apparatus for applying ultrasonic energy to sewage slurry, the apparatus including an applicator (see the specification, e.g., p. 8, ll. 2-6; FIGS. 1 and 2, item 1) having an outwardly facing surface (see the specification, e.g., p. 8, ll. 2-6; FIGS. 1 and 2, item 4), an extender (see the specification, e.g., p. 8, ll. 5-6; FIGS. 1 and 2, item 6) which extends from the outwardly facing surface (see the specification, e.g., p. 8, ll. 5-6; FIGS. 1 and 2, items 4 and 6), and at least one booster (see the specification, e.g., p. 8, ll. 8-10; FIGS. 1 and 2, item 7) at the end of the extender (see the specification, e.g., p. 8, ll. 8-10; FIGS. 1 and 2, items 6 and 7) remote from the applicator (see the specification, e.g., p. 8, ll. 8-10; FIGS. 1 and 2, items 1 and 7) for boosting ultrasonic energy applied thereto to cause the applicator to oscillate (see the specification, e.g., p. 8, ll. 8-15),

wherein the applicator, extender and booster are integrally formed (see the specifcation, e.g., p. 9, ll. 21-24; FIGS. 1 and 2, items 1, 6, and 7).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The ground of rejection to be reviewed on appeal is the rejection of claims 1-9 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kreuter et al. (U.S. Patent No.: 4,013,552) (*Kreuter*, hereinafter) in view of Ehlert (U.S. Patent No.: 5,110,403) (*Ehlert*, hereinafter).

VII. ARGUMENTS

A. The Rejection of Claims 1-9 under 35 U.S.C. § 103(a) as being Unpatentable over *Kreuter* in view of *Ehlert* should be REVERSED.

35 U.S.C. § 103(a) provides the following:

> **35 U.S.C. § 103: Conditions for patentability; non-obvious subject matter.**
>
> A person shall be entitled to a patent unless —
>
> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-9 were rejected in the Final Office Action of April 29, 2009, as being unpatentable over *Kreuter* in view of *Ehlert* under 35 U.S.C. § 103(a). However, *Kreuter* and *Ehlert*, taken either alone or in combination, fail to disclose, teach, or suggest the invention recited in the pending claims.

1. Neither *Kreuter* nor *Ehlert*, Taken Either Alone or In Combination, Disclose, Suggest, or Render Obvious The Invention as Recited in Independent Claim 1 as is Required under 35 U.S.C. § 103

Independent claim 1 (emphasis added) recites:

> 1. Sewage slurry ultrasonic apparatus for applying ultrasonic energy to sewage slurry, the apparatus comprising:
> an applicator having an outwardly facing surface;
> an extender which extends from the outwardly facing surface; and
> at least one booster at the end of the extender remote from the applicator for boosting ultrasonic energy applied thereto to cause the applicator to oscillate,
> **wherein the applicator, extender and booster are integrally formed**.

As seen above, the invention recited in independent claim 1 includes, *inter alia*, the novel feature of the applicator, extender and booster being integrally formed.

Appellants respectfully submit that neither *Kreuter* nor *Ehlert*, either taken alone or in combination, disclose the feature that the applicator, extender and booster are integrally formed, as recited in present independent claim 1.

In the Advisory Action, the Examiner contends that *Kreuter* discloses a sewage slurry ultrasonic apparatus with an applicator and an extender. However, as discussed on page 5, paragraph 4 of the Office Action Response filed on February 13, 2009, *Kreuter* only teaches its applicator and extender being formed as separate detachable components. To provide a booster, the Examiner relies upon *Ehlert*, which discloses a separately formed booster. Therefore, if the skilled person were to combine *Kreuter* and *Ehlert*, he or she is only taught to attach the separate booster component of *Ehlert* to the separate applicator and an extender components of *Kreuter*. As such, even if combining these disclosures, the skilled person still does not arrive at the claimed invention because claim 1 requires that the applicator, extender and booster are integrally formed.

The Examiner has accepted the above points and acknowledged in the Advisory Action that *Kreuter* and *Ehlert* both fail to teach or suggest forming an applicator, extender and booster

integrally. However, the Examiner contends that one of ordinary skill in the art, despite having already combined the teaching of two prior art documents, would then take the further step of modifying these components to form them integrally. We submit that this view is based on impermissible hindsight.

In this connection, in the Advisory Action, the Examiner has raised three points to support his contentions, which we address and refute in turn below.

Examiner's Point 1 - *Howard v. Detroit Stove Works*

The Examiner first submits that it is a universal rule of US case law that forming a one piece article which has formerly been formed in two pieces involves only routine skill in the art. This contention is based on the *Howard v. Detroit Stove Works, 150 US. 164 (1893)* case raised in the final Office Action dated 29 April 2009. Appellants disagree with this assertion for at least the following reasons.

First and foremost, the US Federal Circuit Court has made clear that no such general and universal obviousness rules exist (In *Ochiai, 71 F.3d at 1570, 37 USPQ2d at 1132. Cir. 1995).* This point was further explained in *In re Cofer, 354 F.2d 664, 667, 148 USPQ 268, 271 (CCPA 1966)* by the Court stating "*necessarily it is facts appearing in the record, rather than prior decisions in and of themselves, which must support the legal conclusion of obviousness under 35 U.S.C. §103.*".

In this connection, the reasoning given in *Howard v. Detroit Stove Works* is not relevant to the present case because the facts of the two cases are entirely different. In *Howard v. Detroit Stove Works*, the device concerned is a stove in which a grate was cast in one piece rather than two. However, it would have been clear to the skilled person at the time the stove was made that there was no advantage or functional distinction between forming the grate as one piece rather than two. Consequently, based on these facts it was held in *Howard v. Detroit Stove Works* that forming the grate as a single piece involved no more than mere routine design choice.

In contrast, the claimed invention provides unexpected advantages over the prior art and

represented a significant departure from conventional teaching at the time of the invention. Prior to the present invention, conventional boosters were always provided as separate components, as seen in *Ehlert*. At that time, it was seen as essential to provide boosters as separate components order to allow for:

(i) different boosters to be attached depending on the particular operational and environmental requirements, and

(ii) the booster to be removed and replaced after failure (see page 3, lines 21-29, e.g., of the present application).

This fact is supported by the Examiner's failure to find prior art reference which discloses an integrally formed applicator, extender and booster. Appellants therefore went against conventional teaching at the time of the invention. This was surprisingly found to provide benefits in terms of longevity and reduced servicing requirements which significantly outweighed the loss of design and operational flexibility associated with forming the components integrally.

Accordingly, it is clear that the claimed invention is structurally and functionally distinct from the prior art ultrasonic devices because it represents a clear departure from the construction used in such prior art devices and provides significant advantages there over which would not have been apparent to the skilled person at the time of the invention. Consequently, the reasoning set out in *Howard v. Detroit Stove Works* is not relevant to the present case, and it is therefore submitted that the claimed invention is non-obvious.

Furthermore, prevailing case law makes clear that the Examiner's application of the *Howard v. Detroit Stove Works* is incorrect. In this respect, the USPTO Board of Patent Appeals and Interferences decision *Ex parte MUENCH et al, Appeal No. 2001-0114*, provides a useful summary of how to correctly apply the prevailing case law in reference to the much older *Howard v. Detroit Stove Works* case.

Following this summary, in rejecting claims under 35 U.S.C. § 103, the Examiner bears

the initial burden of establishing a prima facie case of obviousness (see *In re Oetiker, 977 F.2d 1443, 1445,24 USPQ 1443, 1444 (Fed. Cir. 1992)* and *In re Piasecki, 745 F.2d 1468, 1472,223 USPQ 785, 788 (Fed. Cir. 1984)*). The Examiner can satisfy this burden by showing that some objective teaching in the prior art or knowledge generally available to one of ordinary skill in the art suggests the claimed subject matter (see *In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988)*). Only if this initial burden is met does the burden of coming forward with evidence or argument shift to the Appellants (see *Oetiker, 977 F.2d at 1445, 24 USPQ at 1444*. See also *Piasecki, 745 F.2d at 1472, 223 USPQ at 788*).

Accordingly, when determining obviousness, "*the Examiner can satisfy the burden of showing obviousness of the combination only by showing some objective teaching in the prior art or individual to combine the relevant teachings of the references.*" (see *In re Lee, 277 F.3d 1338, 1343, 61 USPQ2d 1430, 1434 (Fed. Cir. 2002)*, citing *In re Fritch, 972 F.2d 1260, 1265, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992)*). Furthermore, as made clear in *In re Dembiczak, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617* "*Broad conclusory statements regarding the teaching of multiple references, standing alone, are not 'evidence'*".

In the present case, *Kreuter* provides no evidence to those skilled in the art that the components of an electroacoustic horn could be formed integrally. In fact, *Kreuter* teaches just the contrary, that its extender and nozzle (applicator) should be formed as separate components to permit different nozzles to be attached to the electroctrostatic horn dependent on requirements (see *Kreuter*, for example, col. 5, 11. 35-44). Furthermore, *Kreuter* could not even be formed integrally because of its complex construction, with internal passageway P and the profiled nozzles N (see *Kreuter*, e.g., Figure 4(c)).

Ehlert also provides no evidence to those skilled in the art that an applicator, extender and booster of an ultrasonic horn could be formed integrally. In this respect, the Examiner has referred to *Ehlert* as teaching a booster. However, contrary to the claimed invention, the booster (601) in *Ehlert* is provided as a separate, detachable, component (see *Ehlert*, e.g., col. 14, ll. 62-68 and Fig. 6).

Therefore, the Examiner has failed to provide evidence that it was either known to one of ordinary skill in the art or suggested to one of ordinary skill in the art to modify the *Kreuter* or the *Ehlert* references to obtain the invention as recited in present independent claim 1. Indeed, *Kreuter* even teaches away from the integral construction taught by the present invention in that it teaches a complex design which could not be formed integrally. As such, the Examiner cannot reasonably sustain his obviousness rejection against the claimed invention.

Examiner's Point 2 - Cost Advantages

The Examiner's second point is that the skilled person would be motivated to form the components combined from *Kreuter* and *Ehlert* integrally in order to achieve cost advantages. However, this is patently untrue. Indeed, forming a geometrically complex unitary body for an engineering application, as in the claimed invention, is in fact much more expensive and time consuming.

In this connection, the present invention concerns ultrasonic apparatuses. With ultrasonic apparatuses, because they are subjected to cyclic loading in use, it is very important that their complement parts have a consistent metallurgical structure with minimal defects. This is to minimise the risk of component failure.

During the manufacture of complex unitary bodies, it is very difficult to maintain a consistent metallurgical structure. For example, it is well known that the presence of joins between different shapes in a casting will make the casting more prone to the inclusion of oxides and stress concentrations. Furthermore, the more complex the casting, the more difficult it is to maintain a consistent grain structure. Similarly, with forging processes, more complex bodies are more difficult to heat consistently throughout, which can lead to thermal shock and cracking as different parts have different temperatures. Again, machining of complex bodies is also more time consuming and expensive because each body must undergo sequential stages of machining on different machines to finish different parts. Consequently, it is much cheaper to form complex bodies from a number of separate components and assemble them because this allows the different component parts to be manufactured separately using more basic manufacturing

techniques, under less complex control.

As such, the skilled person when faced with *Kreuter* and *Ehlert* would not consider that forming the components integrally would provide a cost savings. This is especially true in view of *Kreuter* because its complex construction requiring internal passageways (P) and profiled nozzles (N) could not be formed integrally. Moreover, the skilled person would also not even consider this option because:

(i) it is much simpler and cheaper to form the components separately by conventional methods and connect them together,

(ii) prior to the present invention, it was understood in the art that it was necessary to allow different boosters to be attached depending on the particular operational and environmental requirements, and

(iii) prior to the present invention, it was understood in the art that it was necessary to allow for the booster to be removed and replaced after failure (see page 3, lines 21-29, e.g., of the present application).

The above arguments are supported by the fact that the Examiner has been unable to provide any prior art reference which discloses any motivation to further modify the disclosure of *Kreuter* and *Ehlert* to form their components integrally. As such, the Examiner cannot reasonably sustain his obviousness rejection against the claimed invention.

Examiner's Point 3 - Ehlert Disclosure

Lastly, the Examiner contends that *Ehlert* discloses at column 12, lines 23-31 that it's ultrasonic horn could be formed integrally. This is untrue.

Ehlert states at col. 12, ll. 21-22 an elongated waveguide may be an integral part of the horn. Col. 12, ll. 23-31 of *Ehlert* then goes on to merely provide a definition of what is meant by an "*integral part*". Therefore, *Ehlert* merely discloses that the horn may have an integrally formed waveguide. However, a waveguide is entirely different from a booster and *Ehlert* does

not teach or suggest forming the applicator, extender and booster integrally, as in the present invention.

Indeed, in this connection, *Ehlert* specifies that its booster (601) is provided as a separate, detachable, component (see *Ehlert*, e.g., Figure 6, and col. 14, ll. 62-68). *Ehlert* then goes on to make clear that "*any feature or component which subsequently must be attached to the horn by any means is not an integral part*" (see column 12, lines 29-31 of *Ehlert)*. Consequently, *Ehlert* provides very clear and unambiguous teaching to the skilled person that its booster should be provided a detachably connected component and hence should not be integrally formed with the horn.

Therefore, in summary, the Examiner has failed to provide any evidence that it was either known or suggested to one of ordinary skill in the art to modify the *Kreuter* or the *Ehlert* references to obtain the invention as recited in present independent claim 1. At the time of the invention, such a construction with an integrally formed applicator, extender and booster represented a significant departure from conventional ultrasonic devices. This is exemplified by *Kreuter* teaching away from such a construction, *Ehlert* specifically identifying that its booster is not integrally formed, and the Examiner failing to provide any evidence showing there would have been any motivation or incentive for the skilled person to modify an ultrasonic horn in this way. Accordingly, the invention as defined in present independent claim 1 cannot be considered to be obvious in view of *Kreuter* or *Ehlert*, whether taken alone or in combination.

For at least the above reasons, and the reasons set forth in the previously filed Office Action responses, Appellants therefore respectfully request that the rejection under 35 U.S.C. § 103(a) be withdrawn, and that independent claim 1 be allowed.

Claims 2-9 are also allowable at least by virtue of their dependency from independent claim 1, but also because they are distinguishable over the prior art.

In view of the foregoing, it is submitted that the present application is in condition for allowance and a notice to that effect is respectfully requested.

B. Conclusions

At least for the above reasons, *Kreuter* and *Ehlert*, taken either alone or in combination, fail to disclose, teach, or suggest the invention recited in independent claim 1. The dependent claims are also allowable over *Kreuter* and *Ehlert* based on their own merits and for at least the reasons as argued above with respect to their independent claims.

Accordingly, Appellant submits that the rejection of claims 1-9 under 35 U.S.C. § 103(a) as being unpatentable over *Kreuter* in view of *Ehlert* should be overturned, and an indication of immediate allowability is respectfully requested.

Respectfully submitted,
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Date: November 23, 2009

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VIII. CLAIMS APPENDIX

1. (Previously Presented) Sewage slurry ultrasonic apparatus for applying ultrasonic energy to sewage slurry, the apparatus comprising:

an applicator having an outwardly facing surface;

an extender which extends from the outwardly facing surface; and

at least one booster at the end of the extender remote from the applicator for boosting ultrasonic energy applied thereto to cause the applicator to oscillate,

wherein the applicator, extender and booster are integrally formed.

2. (Previously Presented) Sewage slurry ultrasonic apparatus according to claim 1, wherein the applicator has a central aperture defined by an inwardly facing surface.

3. (Previously Presented) Sewage slurry ultrasonic apparatus according to claim 2, wherein the inwardly facing surface oscillates when ultrasonic energy is applied to the apparatus.

4. (Previously Presented) Sewage slurry ultrasonic apparatus according to claim 1, wherein the integral applicator, extender and booster are formed from a rolled forged, or cast, material.

5. (Previously Presented) Sewage slurry ultrasonic apparatus according to claim 1, wherein the integral applicator, extender and booster are formed from metal.

6. (Previously Presented) Sewage slurry ultrasonic apparatus according to claim 5, wherein the metal is an alloy.

7. (Previously Presented) Sewage slurry ultrasonic apparatus according to claim 6, wherein the alloy is a titanium-containing alloy.

8. (Previously Presented) Sewage slurry ultrasonic apparatus according to claim 5, wherein the alloy is a titanium-aluminum-containing alloy.

9. (Previously Presented) Sewage slurry ultrasonic apparatus according to claim 8, wherein the alloy comprises titanium, aluminum, and vanadium in a molar ratio of 6:4:1.

10-20. (Canceled)

IX. EVIDENCE APPENDIX

There is no evidence related to this Appeal.

X. RELATED PROCEEDINGS APPENDIX

There are no related proceedings to this Appeal.